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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/546,936	04/11/2000	Jui-Ping Li	1056-52	4254

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MICHAEL BEST & FRIEDRICH LLC
401 NORTH MICHIGAN AVENUE
SUITE 1700
CHICAGO, IL 60611-4212

EXAMINER

MOORE, KARLA A

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 08/29/2003

10

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/546,936	LI ET AL.	
	Examiner	Art Unit	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 18-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-17, in Paper No. 9 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-2, 5, 7 and 9 rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,246,500 to Samata et al.

4. Samata et al. disclose an apparatus, in Figure 3, for forming a film on a wafer in a semiconductor process comprising: an inner part (12) for mounting therein said wafer; an outer part (11) covering said inner part wherein a gas inlet (area surrounding 21) and a gas outlet (area surrounding 7) are formed between said inner part and said outer part; and a gas-feeding pipe (21) partially mounted inside said gas inlet for adjusting a feeding gas flowing therein in the direction toward a vertical wall of said outer part instead of said inner part to prevent particles from said inner part from peeling off, whereby said feeding gas is homogeneously warmed before reaching said inner part. The gas contacts the outer tube, which is adjacent to the heater thereby heating the gas homogeneously before reaching said inner part.

5. With respect to claim 2, said inner part is a chamber and said apparatus is capable of performing a chemical vapor deposition process.

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6. With respect to claims 5 and 9, said gas feeding pipe has thereon a plurality of holes on one side near said outer part and having an exit with a specific direction toward said outer part for passing through said feed gas.

7. With respect to claim 7, the length of the gas feeding pipe would be determined relative to the other dimensions of the apparatus. The courts have ruled where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary.

Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

10. Claim 3-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samata as applied to claims 1-2, 5, 7 and 9 above, and further in view of U.S. Patent No. 6,074,486 to Yang et al.

11. Samata et al. disclose the invention substantially as claimed and as described above, including teaching that the inner part and outer part may be constructed of quartz or SiC (column 6, rows 64-68)..

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12. However, Samata et al. fail to teach said gas feeding pipe made of quartz or SiC.

13. Yang et al. disclose a similar apparatus for forming a film on a wafer, they teach the use of quartz and SiC as appropriate construction materials for the inner part, outer part and gas feeding device due to their inherent properties as ceramic materials (column 6, rows 4-5 and 51-53).

14. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided quartz or SiC as the construction materials for the inner and outer parts as well as the gas feeding pipe in Samata et al. in order to take advantage of their inherent properties as ceramic materials as taught by Yang et al.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Samata et al. as applied to claims 1-2, 5, 7 and 9 above, and further in view of Japanese Patent No. 58-197724 to Ichikawa.

16. Samata et al. disclose the invention substantially as claimed and as described above.

17. However, Samata et al. fail to teach said plurality of holes are gradient holes.

18. Ichikawa teaches the use of gradient holes for the purpose of uniformly supplying a gas (abstract).

19. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a gas feeder with gradient holes in Samata et al. in order to uniformly supply a gas as taught by Ichikawa.

20. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Samata et al. as applied to claims 1-2, 5, 7 and 9 above, and further in view of U.S. Patent No. 6,139,642 to Shimahara et al.

21. With respect to claim 8, Samata et al. disclose the invention substantially as claimed and as described above.

22. However, Samata et al. fail to teach the gas feeding pipe has a length shorter than two-thirds of the length of the inner part.

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23. Shimahara et al. teach the use of a gas feeding pipe with a length shorter than two thirds of the length of an inner part for the purpose of facilitating attachment and detachment from a processing apparatus when performing maintenance (Figures 6 and 10; column 29, rows 8-12).

24. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a gas feeding pipe with a length shorter than two thirds of the inner part in Samata et al. in order to facilitate attachment and detachment from the processing apparatus when performing maintenance as taught by Shimahara et al.

25. With respect to claims 9-11, Samata et al. disclose the invention substantially as claimed and as described above, including the capability to control the gas flowing from the gas feeding pipe to a rate within the claimed range and a heater (10) capable of heating to at least the claimed range. Further, because the apparatus is capable of heating to the claimed range, the apparatus would also be capable of obtaining the claimed temperature differential between the non-heated feeding gas and the reaction chamber, which coincides with the claimed processing temperature range.

26. However, Samata et al. fail to teach the apparatus further comprising: a flow controller mounted to said gas feeding pipe; or a pumping device capable of controlling the pressure in said inner part in the range of 0.1 to 1 torr.

27. Shimahara et al. teach the use of a flow rate controller (column 16, rows 22-24) mounted to a gas feeder for the purpose of controlling a flow rate in such a manner as to reach a value, which is preliminarily determined. Shimahara et al. also teach the use of an exhaust system for the purpose of exhausting an atmosphere contained in a reaction chamber and lowering the pressure of a reaction chamber to a predetermined pressure (column 11, row 20-21; column 14, rows 50-52 and 64-65).

Examiner notes that Shimahara et al. is capable of producing a vacuum atmosphere. This fairly suggests that Shimahara et al. would be capable of a pressure of .1 to 1 torr, a range comprising pressures at the very lowest part of what is considered vacuum pressure.

28. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a mass flow controller mounted to the gas feeder in Samata et al. in order to

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control a flow rate in such a manner to reach a value which is preliminarily determined as taught by Shimahara et al. Additionally, it would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an exhaust system in Samata et al. in order to exhaust an atmosphere contained in the reaction chamber and thus lower the pressure of the reaction chamber to a predetermined pressure.

29. Examiner realizes that Applicant has claimed specific process conditions, which are not specifically taught by the prior art. However, the claims are directed to an apparatus, rather than a method for using the apparatus or a method for processing a substrate. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In this case the prior art apparatus teaches the structural limitations of the claim.

30. Claims 12-14 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,246,500 to Samata et al. in view of U.S. Patent No. 6,139,642 to Shimahara et al.

31. Samata et al. disclose the invention substantially as claimed and as described below.

32. Samata et al. disclose an apparatus, in Figure 3, for forming a film on a wafer in a semiconductor process comprising: an inner part (12) for mounting therein said wafer; an outer part (11) covering said inner part wherein a gas inlet (area surrounding 21) and a gas outlet (area surrounding 7) are formed between said inner part and said outer part; and a gas-feeding pipe (21) partially mounted inside said gas inlet for adjusting a feeding gas flowing therein in the direction toward a vertical wall of said outer part instead of said inner part to prevent particles from said inner part from peeling off, whereby said feeding gas is homogeneously warmed before reaching said inner part. The gas contacts the outer tube, which is adjacent to the heater thereby heating the gas homogeneously before reaching said inner part.

33. Samata et al. further disclose the invention as including the capability to control the gas flowing from the gas feeding pipe to a rate within the claimed range and a heater (10) capable of heating the apparatus to at least 900 degrees Celsius. Further, because the apparatus is capable of heating to the

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claimed range, the apparatus would also be capable of obtaining the claimed temperature differential between the non-heated feeding gas and the reaction chamber, which coincides with the claimed processing temperature range.

34. However, Samata et al. fail to teach a flow controller connected to the gas feeding pipe.

35. Shimahara et al. teach the use of a flow rate controller (column 16, rows 22-24) mounted to a gas feeder for the purpose of controlling a flow rate in such a manner as to reach a value, which is preliminarily determined.

36. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a mass flow controller mounted to the gas feeder in Samata et al. in order to control a flow rate in such a manner to reach a value which is preliminarily determined as taught by Shimahara et al.

37. Examiner realizes that Applicant has claimed specific process conditions, which are not specifically taught by the prior art. However, the claims are directed to an apparatus, rather than a method for using the apparatus or a method for processing a substrate. The courts have ruled that a claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987). In this case the prior art apparatus teaches the structural limitations of the claim.

38. With respect to claim 13, the length of the gas feeding pipe would be determined relative to the other dimensions of the apparatus. The courts have ruled where the only difference between the prior art and the claims is a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device is not patentably distinct from the prior art device. In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984).

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39. With respect to claims 14 and 16, said gas feeding pipe has thereon a plurality of holes on one side near said outer part and having an exit with a specific direction toward said outer part for passing through said feed gas.

40. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Samata et al. and Shimahara et al. as applied to claims 12-14 and 16-17 above, and further in view of Japanese Patent No. 58-197724 to Ichikawa.

41. Samata et al. and Shimahara et al. disclose the invention substantially as claimed and as described above.

42. However, Samata et al. and Shimahara et al. fail to teach said plurality of holes are gradient holes.

43. Ichikawa teaches the use of gradient holes for the purpose of uniformly supplying a gas (abstract).

44. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a gas feeder with gradient holes in Samata et al. and Shimahara et al. in order to uniformly supply a gas as taught by Ichikawa.

Response to Arguments

45. Applicant's arguments, see Paper No. 7, filed 02/19/03, with respect to the rejection(s) of claim(s) 1-17 have been fully considered and are persuasive. As amended, the claims define over the prior art as used in the rejections of the Office Action in Paper No. 7. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Samata et al. Samata et al. teaches a gas feeder for adjusting a feeding gas flowing therein in the direction toward a vertical wall of said outer part instead of said inner part to prevent particles adhered to said inner part from peeling off.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 703.305.3142. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on 703.308.1633. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.308.0661.

km

*Primary Examiner
AU 1763
D. Hassanzadeh*